

## Flight Controllers Tune Up Skills Between Missions

Athletes, typists, musicians and many other professions must use their talents on a regular basis or face the loss of the acuity that makes them first rate, and so it is with flight controllers for a mission in space.

With the extended periods between space flights, to allow

## NASA Aids In Effort to Save Corn Crop

The National Aeronautics and Space Administration in conjunction with Purdue University has been coordinating an effort in Indiana the past three weeks aimed at establishing whether the current corn blight infestation can be spotted from sensing devices carried aboard aircraft.

First data analyzed shows that the fungus infection, "southern leaf blight," can be identified from aircraft in its severe stage and it appears to show up at earlier stages as well.

Analysis has not been completed, but color photographs as well as multispectral scanner pictures and data show what photo interpreters call "signature keys" to the crop disease. That is, various gradations in color in the photos appear only when the blight is present.

Successful identification can be important to agriculture in the future because it promises that remote sensing can give farmers warning of crop diseases approaching or even present in their fields before they are aware of it.

Another promising aspect is that large areas of farmland may be quickly and accurately surveyed from the air and probably, in the future, by satellite. The knowledge gained (type of crop in each

*(Continued on Page 2)*

## Piland Named to Head Earth Resources Lab

Robert O. Piland, Deputy Director of Science and Applications at MSC, has been named to head a newly-established Earth Resources Laboratory at NASA's Mississippi Test Facility.

Piland previously served as acting head of MSC's Earth Resources Division and was Technical Assistant to MSC Director Robert R. Gilruth. He will retain his present position as Deputy Director of Science and Applications as well as serving as Director of the Earth Resources Laboratory.

The laboratory is to be directed by the Manned Spacecraft Center and will employ about 75 government and contractor personnel initially, with a planned growth to about 185 over the next two years.

The effort at MTF will stress research in the applications of remote sensing techniques using data generated by Earth Resources

more time for analysis of information acquired, and assimilation of this into follow-on flight plans, there is a period of time when the activity level in flight control drops off.

To counteract the possible loss of the keen vigilance required on the consoles in Mission Control Center, the Flight Control Division at the Manned Spacecraft Center has instituted a proficiency simulation program for flight controllers.

Prior to the time period when active simulations begin for a flight, a series of proficiency simulations will be scheduled. At least two full simulations will be conducted in Mission Control Center each month, normally at two-week intervals.

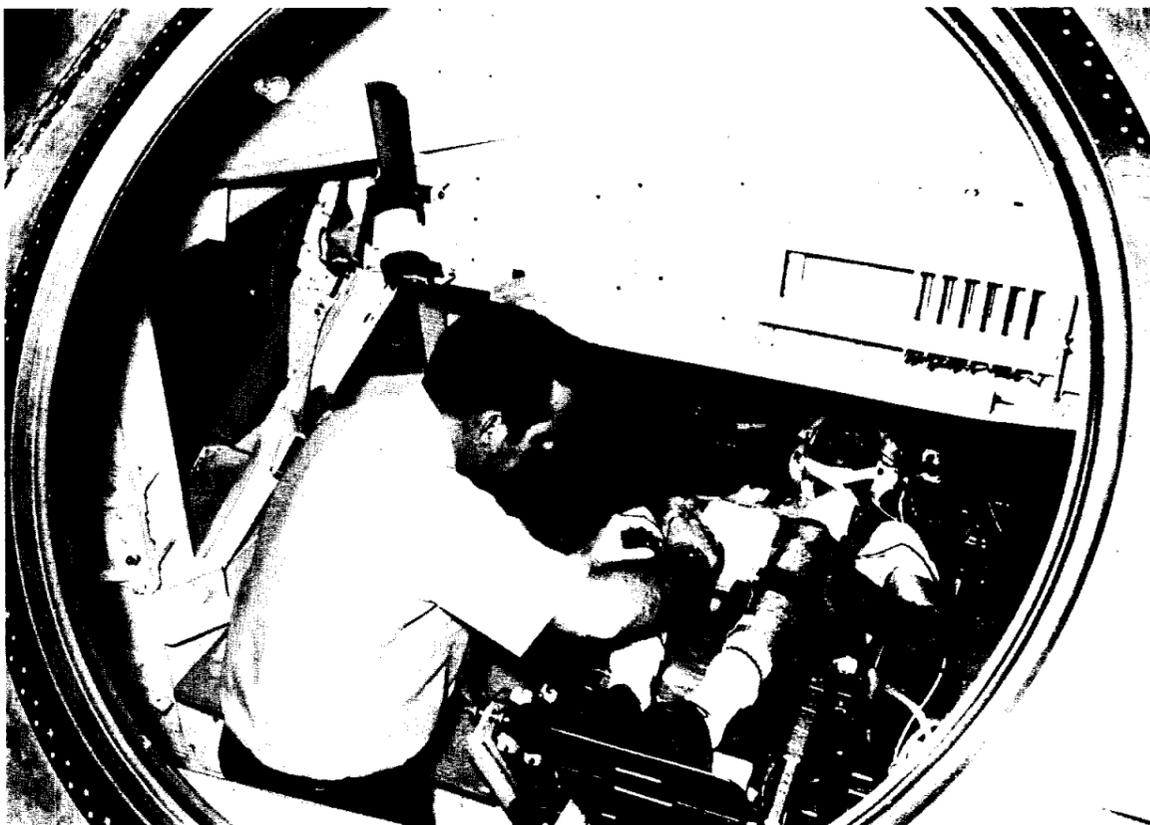
## Errant Balloon Drifts Westward Towards Pacific

A runaway balloon borne scientific package, the result of a faulty descent system was floating 18-miles above Redmond, Oregon at Roundup presstime Wednesday.

NASA and other government agencies are tracking the errant balloon by radar and predict the balloon and its 1,200 lb scientific package may descend within the next 24-48 hours. Poor weather in the Boise area earlier had restricted visual contact with the system and contact has been by

*(Continued on Page 2)*

Keep Oct. 11 open  
on your calendar.  
See "Oktoberfest",  
page 3.



Sid Gillespie, an Air Force Academy technician, installs instrumentation on Tech Sgt. Philip A. Robinson in preparation for centrifuge test to determine human tolerance to space shuttle reentry. (See "Centrifuge," page 2)

# ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS

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## TWO FLIGHTS CUT

### Paine Outlines Apollo Future

NASA Administrator Thomas O. Paine announced plans September 2 to reduce the remaining number of Apollo lunar missions to four, dropping Apollo 15 and 19 and completing the remaining four flights before the first Skylab mission in November 1972.

Paine said the action was taken as part of an interim operating plan for fiscal year 1971 which

reduces NASA's budget request from \$3.333 billion to \$3.268 billion—the amount appropriated by Congress in a bill vetoed last month by the President.

NASA and several other government agencies are being funded through continuing resolutions pending action on a new appropriation by Congress.

In arriving at the FY 1971 Interim operating plan, Paine said NASA's management considered the scientific, technological and practical benefits to be gained from each of the alternatives as well as the costs.

"In our discussions," he said, "it became clear that the vitality of our national space program depends on a determined and vigorous continuation of plans for a reusable space shuttle followed by a space station in the manned flight program, early development of Earth Resources Technology and Application Technology Satellites, the High Energy Astronomical Observatory, the Grand Tour unmanned flights to the distant planets, the unmanned Viking Mars landers, and Mariner and Pioneer flights to Venus, Mercury and Jupiter, and a healthy aeronautical research program."

Paine said the Lunar and Planetary Missions Board and the Space Science Board of the National Academy of Sciences strongly recommended that NASA carry out all six remaining lunar landing missions.

He said, however, "based on operational and both short and long term economic considerations

... we have most reluctantly concluded that a reduction of two

*(Continued on page 2)*

## AIAA Opening To Feature Apollo Report

An Apollo Program Report will highlight first-day sessions this year at the 7th Annual Meeting and Technical Display of the American Institute of Aeronautics and Astronautics to be held in Houston.

Leaders of America's aerospace effort will convene at the Astrohall October 19 through 22 for four days of meetings which will cover a variety of space subjects.

Four Apollo papers are on the evening agenda. Anthony J. Calio, head of MSC's Science and Applications Directorate will talk on Scientific Results. He will be followed by Astronaut Charles Conrad, commander of the Apollo 12 flight and this country's third Moon walker. Conrad will discuss Lunar Landing Techniques.

Richard S. Johnston, manager for Experiments in the Apollo Spacecraft Program Office, will present a paper called Apollo Scientific Experiments, and Glynn Lunney, chief of the Flight Director Office at MSC will close out the evening with a technical presentation called Apollo 13

*(Continued on page 3)*

## Extra Battery, More Oxygen Added to SM

The Apollo spacecraft command and service modules will be modified to enhance their potential use in an emergency mode.

The decision followed an extensive study of consumables and emergency equipment aboard the spacecraft as recommended by the Apollo 13 Review Board.

The modification includes adding a 400 amp hour battery in the service module as an alternate power source in the event the spacecraft's main power supply failed. Provisions will be made to store an additional 20 pounds of potable water in the command module.

Earlier, a decision was made to add a third oxygen tank in the service module as a part of the redesigned spacecraft oxygen system.

These modifications would permit a powered down mode of emergency flight from lunar orbit to landing back on earth.

aircraft flying out of Houston, the Earth Resources Technology Satellites (first launch planned for 1972), and on the manned orbiting Skylab spacecraft scheduled to be launched in 1972.

The information gathered by aircraft and spacecraft will be correlated with data gathered on the surface and will be analyzed for potential benefits to such area interests as seafood, forestry and agriculture, as well as erosion and pollution monitoring of the Gulf Coast and area growth planning.

The new laboratory will complement and supplement Earth Resources programs underway at NASA's Goddard Space Flight Center, Greenbelt, Md., and at the Manned Spacecraft Center.

Expert in physics, geoscience, instrumentation, and data handling will be brought in to staff the facility.



Duane Ross, MSC Personnel Division, discusses job openings and background requirements with employee affected by RIF.

## MSC Outplacement Center Aids RIFed Employees

The MSC Outplacement Center in Bldg. 45 has been the scene of considerable activity since it opened on August 24. During the first 2 weeks of the Center's operation, 168 employees have been interviewed by outplacement counsellors in order to determine their employment interests and to register them for outplacement programs for which they are eligible.

During this past week representatives of 16 organizations, including Federal agencies, universities, and private industries, visited the Center to review resumes of these employees and to interview those in whom they were interested. This screening of resumes and interviewing will continue for several more weeks.

Information regarding job opportunities with both Government and private organizations throughout the country continues to come in to the Outplacement Center as a result of letters and phone calls made by personnel of the Center. Notices concerning these positions are posted daily on bulletin boards or listed in loose leaf binders located in room 546 of Bldg. 45.

Employees affected by the reduction in force are encouraged to consult these listings periodically in order to keep abreast of the latest openings. In addition, outplacement counsellors will continue to search for job opportunities and to inform employees to whom they have talked of available positions for which they qualify.

Any employees affected by the RIF who have not contacted the Outplacement Center are urged to call extension 5437 for information and assistance.

## Corn Blight—

(Continued from Page 1)

field, size of the field, crop vigor, detection of any damaging agents and eventually yield-per-acre) may be used regionally and nationally on a timely basis by private and government interests to help keep the supply of essential foods or fibers in balance with demand.

The Manned Spacecraft Center and Purdue University, Lafayette, Ind., are the principal participants in the experiment, with an aircraft from the University of Michigan, Ann Arbor, and an Air Force C-131 also involved.

The test site extends from Michigan City in north Indiana to the Evansville area in the southernmost part of the state.

High altitude coverage from 60,000 feet, was provided by NASA's Earth Resources aircraft,

## Apollo Future—

(Continued From Page 1)

of the remaining Apollo flights should be made.

This decision will give the space program some additional flexibility, providing Apollo hardware for possible use in the Skylab, Space Station or other programs where manned operations or a heavy boost capability is required."

The budget request for Apollo is being reduced by \$42.1 million to \$914. million. This reduction will be achieved through reduced operating costs for Apollo and a more rapid phasedown in manpower levels at all major Apollo facilities.

The remaining Apollo missions will be designated Apollo 14 through Apollo 17. Astronauts Alan B. Shepard, Jr., Stuart A. Roosa and Edgar D. Mitchell are scheduled for a January 31 launch to the moon aboard Apollo 14. Astronauts David R. Scott, Alfred M. Worden and James B. Irwin, who were assigned to the cancelled Apollo 15 mission, will fly the newly designated Apollo 15 mission scheduled for launch in July, 1971.

NASA Assistant Administrator William E. Lilly said NASA-wide Civil Service employment would be cut by 900 positions through the current reduction-in-force which is scheduled to be completed October 1. He said the interim operating plan is designed to live within the \$678 million appropriated in the vetoed bill for resources and program management. Overall NASA employment, including contractors, will be down to 142,000 by the end of the current fiscal year—18,000 fewer than are now employed and 3,000 fewer than the work force envisioned for the end of FY 71 in the previous budget plan.

Lilly said the largest part of the added reduction would occur at Apollo contractor facilities in California and New York.

Construction of new facilities, including a calibration laboratory planned for the Manned Spacecraft Center, will be deferred under the interim operating plan. The plan also defers construction of a new polymer research laboratory at NASA's Ames Research Center and of a multi-spectral photo laboratory at the Marshall Space Flight Center.

an RB-57F, from MSC, which took both visual and infrared color photos as well as black and white.

A Purdue Beechcraft with multiband cameras aboard, flew between 5 and 10,000 feet, the University of Michigan C-47 with a multispectral scanner flew at 3,000 feet and the Air Force C-131 covered the area with cameras at an altitude of 17,000 feet.

Weather conditions were good during all flights, except that of Michigan flight when they were considered marginal.

BOY...THAT SNOOPY  
IS REALLY UP THERE  
DOING HIS THING...



The Roundup is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

## Centrifuge Runs Simulate Space Shuttle Reentry

Nine volunteer test subjects will spend seven days in bed and then undergo high acceleration loads in a centrifuge at NASA's Manned Spacecraft Center to determine man's physiological tolerance to reentry loads calculated for NASA's Space Shuttle program.

The test subjects (all enlisted men from Brooks Air Force Base, San Antonio) will ride the centrifuge and be exposed to "eye balls down" re-entry configurations at G-levels ranging from 2.5 to 4.5 for periods up to six minutes 10 seconds.

Dr. William Shumate, principal investigator in charge of the experiment said the purpose of the tests is to determine what effects prolonged "eye balls down" reentry acceleration will have on space shuttle crew members and passengers who have spent long periods in a weightless state.

Nominal space shuttle reentry mode of the MSC straight wing shuttle produces the downward through the head (plus G) acceleration as opposed to acceleration forces through the chest (plus G) or "eye balls in" experienced in Mercury, Gemini and Apollo manned space flights.

The test program is scheduled to begin September 8 when the first group of three volunteers climb into bed for the first 24-hour bed rest. The test subjects will be bedded down in the Crew Reception Area of the Lunar Receiving Laboratory. The nine volunteers will be divided into groups

of three, with each group following the same test twenty hours apart.

After 24 hours bed rest, the first group will be transported by ambulance from the LRL to the centrifuge where they will be exposed to shuttle reentry profiles (2.5 to 4.5 Gs). Numerous medical and operational parameters (respiration rate, heart rate, indirect blood pressure, voice, etc.) will be measured during each run and recorded on strip chart and magnetic tape for future evaluation.

In addition to centrifuge data, each test subject will undergo numerous physiological measurements prior to and immediately following the acceleration runs in the centrifuge.

The first group of test subjects will begin their seven day bed rest on September 14, with the other groups following in 24-hour periods. All test subjects will have completed the 24-hour and 164-hour bed rest and subsequent centrifuge runs by September 23.

During the peak acceleration runs the test subjects will be required to view and call out to medical monitors the numbers which light up on a digital display inside the centrifuge gondola.

The volunteers are USAF Technical Sergeants Elmer L. McCoy and Donald L. Watson; Staff Sergeants Earl V. Fraley and Philip A. Robinson; and Airmen First Class William N. Hursta, Michael D. Johnson, Joseph D. Mundy, Howard J. Perlman and Wilbur C. Williams.



Dorothy Newberry, cost reduction representative of the Institutional Resources & Procurement Division, receives Cost Reduction Group Achievement Award from MSC Associate Director Frank A. Bogart while IR & P Division Chief W. R. (Bill) Kelley (center) looks on Miss Newberry's organization was responsible for 18 suggestions reducing government expenses a total of \$1,742,906.

## Dallas, St. Louis Firms to Study Shuttle Heat shield

The NASA Manned Spacecraft Center has awarded six-month parallel contracts for the development of radiative non-metallics to be used as high temperature heat protection on the space shuttle.

Winning the awards are the Missiles and Space Division of Ling-Temco-Vought, Dallas, Texas, and the Astronautics Company of McDonnell Douglas Corporation, St. Louis, Missouri.

The fixed-price contracts are expected to cost approximately \$215,000 each.

Unlike the single-flight Apollo heat protection that was required for one mission, the space shuttle is designed to operate as an airplane for many missions and to provide a comparatively low cost method of transportation.

To meet multi-flight requirements, NASA is seeking a new generation of materials which can be applied to the leading edge of the shuttle orbiter wing and tail surfaces.

The major goals of the studies are to achieve a reliable leading edge design and materials with a multi-mission life capable of withstanding up to 4,000 degrees F; and this must be done as reasonable weights and costs.

The two contracts are for the first phases of the development of an oxidation resistant carbon-carbon material called Reinforced Pyrolyzed Plastic (RPP) composite. The contractors will study various processing techniques, characterize the materials by obtaining thermal and physical properties and make evaluation studies.

Reinforced pyrolyzed plastic composite are a new family of high temperature materials which are intended for long-term use in high temperature, highly oxidizing, high heat flux environments. They are made by reinforcing a plastic, such as phenolic, with carbon or graphite fibers or fabric, fabricating or machining the part to the shape wanted, then suring, pyrolyzed and graphitized under heat up to 4,600 degrees F. in an inert environment.

## College Credit? Advise Personnel

All MSC employees who have completed undergraduate courses on campus at local colleges and universities are asked to submit copies of grade reports for the past year to BP3 as soon as possible. Grades will then be placed in their Personnel Folder so that the employee will receive appropriate credit.

**Plan to attend**

AEROSPACE

FOR MAN'S NEEDS

**AIAA Oct. 19-22**  
**Houston Astrohall**

## AIAA Meet—

(Continued from Page 1)

Problems. The session chairman is James A. McDivitt, manager of ASPO. He is assisted by Edward B. Hamblett, also of ASPO.

This year's AIAA convention will have sessions covering Frontiers of Research and Technology, National Aeronautical Programs, the National Space Program and Special Sessions such as the Apollo report.

Dr. Robert R. Gilruth, MSC Director, is the general chairman.



**33 years**  
**Robert H. Voigt**  
**NASA Regional Audit Office**

**25 years**  
**Mrs. Ara E. Coker**  
**NASA Regional Audit Office**

## "Oktoberfest" Theme of MSC Picnic

The MSC picnic, "Oktoberfest", will be held at Camp Mansion near Friendswood Saturday, October 10 from 12 noon to 6 p.m.

In addition to all the barbecue beef and links, potato salad, ranch style beans, relishes and french

bread you can eat, the picnic will feature a dance band and a water ballet exhibition by the Jeannette Chase team of Houston, with carnival rides, a treasure hunt and games for the kids. Adult beverages and soft drinks will be the "coolers" for the day.

Anyone interested in slow pitch should work up a team and contact Jack Streit, extension 4358. Those interested in volleyball should also form a team and contact Dennis Doherty, extension 2741.

There will be prizes for costumes which best carry out this year's theme, "Oktoberfest", with male and female categories for adults and children.

MSC employees, their families and guests are cordially invited to attend.

"Oktoberfest" tickets go on sale beginning September 15 and may be purchased in both cafeterias, through committee members, and in the lobbies of building 45 and building 2 every day from 4 to 5 p.m. beginning September 15.

Ticket prices are \$1.50 for adults, \$1.00 for children 3 to 12 years of age, and children age 2 and under admitted free.

## Casey to Speak At AFGE Meet

U. S. Representative Bob Casey, District 22, will address members of the American Federation of Government Employees, Local 24, at the Manned Spacecraft Center Monday, September 14.

The Houston-area Congressman will discuss and answer questions on Congress and space appropriations.

The meeting will begin at 5 p.m. in the auditorium of Building 30.

Interested MSC employees are invited to attend.

## Roundup Swap-Shop

(Deadline for Swap-Shop classified ad is Thursday of the week preceding Roundup publication date. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 15 words, including name, office code and home telephone number. Send ads in writing to Roundup Editor, AP3)

### REAL ESTATE

Three lots in Frontier Lakes, Montgomery Co., 2 mi. from Willis. All three total \$999. Prim, 877-2856.

Lease, 3-2-1 brick in Dickinson, 1/2 acre, trees, big den, air, heat, fireplace, stove, dishwasher, carpets, screened porch, \$175/mo. Childs, 534-5944 after 5 pm.

Clear Lake City, 4 bedrooms, 2 1/2 bath, 2 1/2 detached garage, 2240 sq ft living area, large lot, low equity. Vozzo MI 4-3401.

Equity Spanish brick, 3-2, 16x18 living dining, 7 ft bar, central A & H, built-ins, Hotpoint washer/dryer, 24'x28' garage slab, lg lot, 10 mi MSC, Call 966-2337 after 5:30 pm.

Nassau Bay Colonial, 3-2-2, fenced, corner, formal living & dining, fireplace, \$28,500. Assume 5 1/4%. Bell, 591-2340.

Bayou Chantilly, Dickinson, 3-2-2, large lot, fireplace, sunken living rm, equity, 6%, \$133/mo. Young, 488-5530.

League City near high school, 4-BR brick, 2-story, \$6500. equity, assume 5 1/4% at \$174/mo. Call 932-3169.

### AUTOS

65 Ford Country Esquire Station Wagon, radio, air, power, clean, one owner, \$995. or best offer. Holland, 468-5046.

68 Opel 1900, Deluxe Station Wagon, AM/FM radio, air, low mileage, \$1495. Keyes, 591-2132 after 5 pm.

69 VW, radio, heater, chrome group, vinyl seats, \$1425. Morian, 473-1422.

62 Ford SWB 1/2-ton pickup with new motor, tires, brakes, paint, seat covers, & other new items. \$700. with camper, \$600 w/o camper. Donnell, 877-1746.

67 Ford Fairlane Wagon, loaded, below avg. retail, xln cdt, \$1495. Bell, 591-2340.

66 Olds 98, 4 dr sedan, all electric, new tires, good cdt, Waddell, 932-3881.

64 Pontiac Cat 9-pas wagon, one owner, xln cdt, \$945. Sayers, 591-4378.

66 Overhead Cam 6, Pontiac engine, 40,000 mi. new valve job, less carb. \$50. 66 Pontiac 2 speed auto trans, xln cdt \$35. 67 Saginaw 4 speed trans with Muncie shifter, needs cluster & reverse gear \$25. 65 GTO 3 speed heavy duty trans, all synchronized with shifter, xln cdt \$60. Statz, 482-7607 after 6 pm.

69 Buick Riviera, cream puff. Royston, 487-2739.

68 VW Bus, xln cdt, new muffler, generator & battery, tape deck w/4 speakers, \$1650. Cook, 591-3329.

65 Ford Ranchero truck, must sell, bought another car, \$650. Jaguar Mark I for parts. 3.4 liter engine, solid body & good seats. Prim, 877-2856.

65 Ply Barracuda, V-8, auto, no air, \$550. Tom, 944-3671.

### MISCELLANEOUS

Armstrong flute and case, good cdt, xln for student, \$90. Nelson, 488-1335.

Conn Cornet w/ Samsonite case, very good cdt, \$60. Piland, 534-5915.

SCUBA Diving Instructions, NAUI certification, Clear Lake City Sec Cntr, \$40. Start Sept 14, 7:30 PM. Call 488-0360 or 433-3273.

Pony Saddle, new condition, \$35. Abel, 946-8245.

6-ft Grandmother clock, pine, Westminster chimes, handcrafted. Griffin, 482-7198 after 4 PM.

Dinette table and 4 chairs, good condition, \$20. Hayes, 488-3488.

22-ft Chris Craft open sea skiff, 170 hp, interceptor engine, very clean, Clomburg, MI3-2402.

19-ft Sailboat, Lightning, centerboard, wooden with fiberglassed deck, three sails, new trailer, \$1500. Schiesser, 482-3217.

Also Saxophone, 2 yrs old, fine instrument, good condition, ori cost \$300. sale \$175. Wood, 877-4705.

Kenmore sewing machine head, button-holer, all atchmts, will fit base or cabinet, xln cdt, \$35. Raspberry, 473-7764 after 6 pm.

Pool Table, 3 1/2 x 7 regulation size, good cdt, \$50. Hammack, Kemah 877-1657.

Antique typewriter \$50. Snare drum, blue metal flake, w/stn \$20. 17-ft 1969 Travel Trailer w/air \$1700. Donnell 877-1746.

Student trumpet, used, \$50. Ward, 591-2182.

Webcore, tape recorder, 4 track, record mono., plays stereo, \$125. Friend, 932-5772.

Dining room suite w/buffet, \$495. Oval rug 15' x 20', \$35. Call 649-2569.

Double bed (box springs, mattress, frame) \$50. end table \$10. dinette table & chairs \$25. chair & ottoman \$25. or make offer. Parker, 483-2891.

Fall, human hair, dark brown, set and styled, \$25. Boin, 488-1244.

15' Glass 35 Johnson OB. B.W. Trailer and 400' Beachnet, \$650. Scogin, 643-7676.

Boat top, side curtains, fits 16-17 ft boats, like new, \$150. value for \$75. Brizzolara, 591-2509.

New 1970 Suzuki TC-90 with turn signals, less than 50 mi. \$375. Donnell, 877-1746.

8-ft O'Day Sailboat w/dolly type trailer, \$100. 7-ft brown naugahyde couch, \$75. Both in xln cdt. Spann, 877-2150.

Golf clubs, Wilson X-31 DS stiff aluminum shafts 1-3-4 woods 2-9 PW SW Irons, \$175. Cohn, 488-4144.

Cannon 35 mm electric eye camera, case, manual & tripod, \$40. Sears semi-automatic 22 rifle & cleaning kit, \$30. Krisberg, 944-4319.

14-ft aluminum V-bottom boat with 25 hp Johnson motor, used 2 summers, \$600. Call 932-2836 after 6 pm.

Piano, upright, xln cdt, \$175. Moseley, 487-2394 after 5 pm.

Hotpoint ironer, very good cdt \$25. Artley Flute w/case, Cost \$185. new, used 6 mo. Make offer. Chaviers, 932-5925.

12-ft Aluminum runabout w/4hp outboard, xln cdt, make offer. Freden, 877-1866.

Allied model 2682 solid state 8-band FM-

AM-SW-VHF portable radio, \$50. Nance, 946-1732.

RCA Victor B & W portable TV; old battery radio, poor cdt, make offer, Gaventa, 487-0523.

Upright freezer, refrigerator, washer, electric dryer, Early American couch w/matching chair, 2 lounge chairs, trundle couch/makes twin beds, small chest of drawers, sewing machine/cutting table, gas lawnmower, edger, garden cart. Wells, 932-3145 after 5:30 pm.

New Honda 450 SS, red, less than 500 mi. \$1050. Bean, 591-3814.

67 Honda 305 Scrambler, xln cdt, 5,000 mi. \$325. Blucker, 488-4188.

Golf clubs, 4 irons, dual wedge, 3 woods, putter, bag w/wood stocks, \$50. White, 488-1024.

Den set (sofa & chair) brown naugahyde, good cdt, \$49. Pawlowski, 591-2095.

Attractive contemporary oval walnut dining table, Glenn design, four chairs, \$100. Bocking, 483-2283.

### PETS

AKC Beagle puppies, 8-wks old, beautifully marked, males \$30. females \$25. Abel, 946-8245.

Five free kittens, housebroken, 7 wks old, varied colors. Dahms, 488-0156.

Cocker-Spaniel puppies, AKC registered, buff & red, 6 wks old, \$75. Boin, 488-1244.

### WANTED

Advisors, men & women, for Boy Scout Explorer Post 895 in Seabrook. Must have good moral character and be interested in working with young people. Men should be interested in aviation, aquatics, radio, and motorcycles. Donnell 877-1746.

15 cu ft upright freezer. Must be in A-1 condition. Goshorn, 944-3948 after 6 pm.

Furnished room or efficiency apt within 10 mi of MSC by mid-Sep. McCandless, 483-4464.

Lost Bike, stolen from CLC swimming pool Aug 17, Sears, blue, banana seat, 5-sp, reward. Hooper, 488-4120.

26" bike for a woman and a man, must be in good condition and reasonable. Chaviers, 932-5925.

Roommate (female) to share nice apt. in Webster, \$67.50/mo. Daryl, 932-4304.

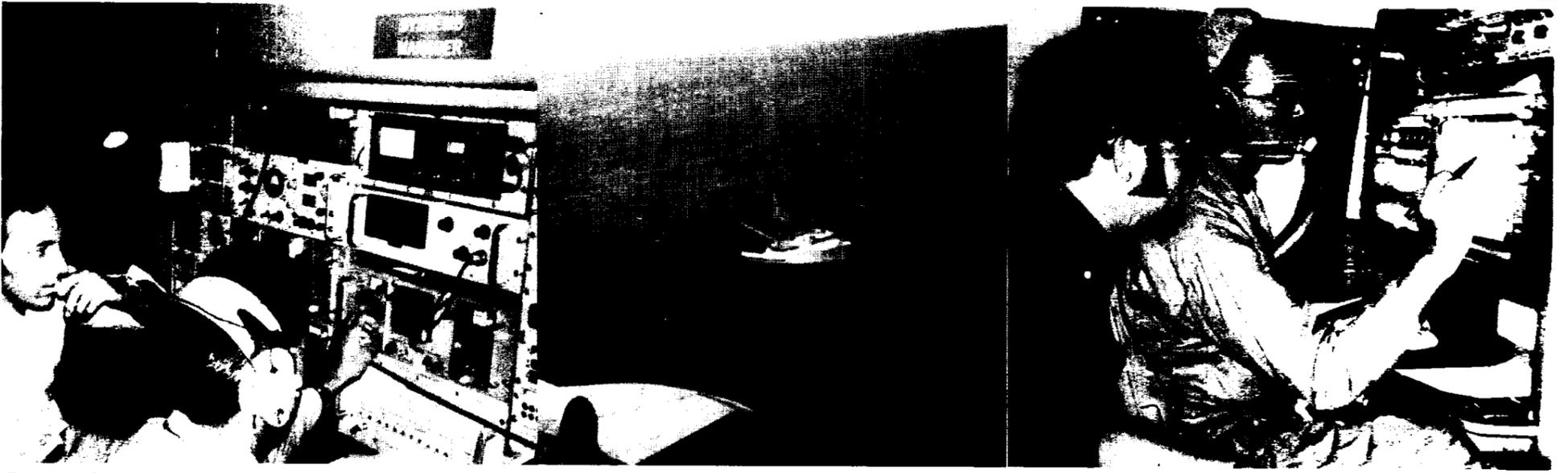
To share ride between Sagemont & San Jac College on Wed & Thurs nites, classes 7 to 10 pm Sampson, 487-2716.

To buy used Go-Kart. Condition not too important. Siler, 591-2787.

Come to this year's MSC Picnic "Oktoberfest," October 10, 1970, 12:00 pm to 6:00 pm at Camp Mansion near Friendswood. Tickets will be on sale in the MSC Cafeteria and through Committee members beginning Sep 15, 1970.

### PERSONALS

On behalf of my sons and myself, I want to express my sincere thanks and appreciation to my friends at MSC for your kindnesses and thoughtfulness during the very difficult days just passed. Jim Poindexter.



Engineers Gerald Flannagan and Ray Rivas read instruments . . . as aircraft passes over 'Cayuse' OSU's Ken Scott and systems engineer J. D. Roberts monitor water temperature . . .

## EARTH RESOURCES REPORT

# MSC Aircraft Searches for Clues to Tuna Fish Grounds

The white and gray four engine NASA aircraft cruised along 1,500 feet above the wave tossed Pacific Ocean, 20 miles off the rugged coast of Oregon.

NASA Manned Spacecraft Center pilot Jerry Cobb called over the aircraft intercom, "Nine miles to the Judy K, somebody watch for the boat." The aircraft flew over the 35-foot boat, and then flew towards its next target, 100 miles away.

The NASA aircraft followed this pattern for seven days recently as a part of a cooperative effort with Oregon State University. The aircraft, a converted Lockheed Electra NP3A, logged more than 11,000 miles over the Pacific collecting data which may prove helpful in catching the elusive fast-swimming albacore tuna.

The NP3A, equipped with sophisticated electronic gear, traced a zigzag path for seven days 1,500 feet above the surface of the ocean recording sea temperatures and water color differences for OSU oceanographers. The NP3A is one of three aircraft utilized in Earth Resources Surveys Program by the NASA Manned Spacecraft Center, Houston, Texas.

Aboard the NP3A was a team of NASA and OSU engineers and scientists who operated and monitored the special sensing and recording instruments. The aircraft gathered data—water color and sea temperatures—was relayed daily by marine operators to the tuna fleet and used by OSU's extension Marine Advisory Program "Project Albacore" to learn more about water conditions in an attempt to derive workable methods of predicting where and when albacore will be found.

The "real time" data collection and distribution operation which is part of OSU's "Albacore Central" was originated in 1969 to provide fishermen helpful water and weather conditions. "Albacore Central" make no pretense to being a fish "prediction" service, according to OSU coordinator Dan Panshin.

Panshin, whose group correlates information from the NASA

aircraft as well as other inputs from extension agents along the coast, fishermen, and weather agents, explained "Albacore Central attempts to help the fisherman by gathering information about factors that may affect the fishery. It leaves to the individual fisherman the judgment about where and when he should fish."

An "Albacore Central" representative who was aboard each flight monitored the sea temperature measuring device (PRT 5-Precision Radiation Thermometer) and relayed data to the central operations center located at OSU campus at Corvallis, Oregon. It was correlated with other data and relayed via marine operator to the fishing fleet twice daily (10:15 p.m. and again early the following morning).

The long range look of "Project Albacore" is being brought into focus by Dr. William Percy and Dr. June Patullo of OSU's Oceanography Department. "Fishermen know that in the waters off the Pacific Northwest they'll find albacore in the water that is between 58 and 65 degrees Fahrenheit. In our research, we're attempting to relate in a systematic way the factors that determine whether albacore will be present in a particular area and just how abundant they will be," Dr. Percy explained.

Their studies focus on such factors as sea-surface temperature, water color, presence of forage animals (feed), and oceanographic phenomena, including the upwelling of cold, salt water from the depths and the plume of relatively fresh water expelled into the ocean by the Columbia River.

NASA's role in "Project Albacore" consisted of the four engine aircraft flying over the two OSU oceanographic ships—the 85 foot Cayuse and the 35 foot chartered fishing vessel Judy K.—which formed two points of a triangle. The aircraft, with its complement of scientists and engineers, flew over the two ships and then went out as far as 150 miles to the imaginary point in the Pacific to complete the triangle.

The Cayuse and Judy K, each equipped with instruments to gather water temperature, salinity, water color data, changed position after each pass of the NASA aircraft. Position changes were directed by aircraft radio by James Mueller, chief OSU oceanographer. The two research ships provided the "water truth" data which OSU later correlated with the aircraft data.

"Project Albacore" flights were concentrated along the path of the Columbia River 'plume', outflow of the river into the Pacific. The 'plume', a distinct section of water with lower salt content higher nutrients and warmer temperature, is believed by scientists to form a 'corridor' which albacore favor.

This is the second year of the OSU cooperative effort which in addition to the NASA has brought into play numerous other information gathering government and state agencies. Most important, perhaps, is the fisherman themselves, the "customer" of the "Project Albacore."

Hundreds of the 750 fishermen which comprise the Oregon tuna fleet have cooperated in this effort with OSU and NASA. Each day the fishermen write in their log sea temperature, water color, weather, and most importantly, the number and location of each albacore catch.

NASA mission manager for "Project Albacore" was Leon Ballinger, of the Aircraft Project Office of MSC's Science and Applications Directorate. Aircraft personnel were from the Flight Crew Operations Directorate, with Cobb as pilot and Ed Mendenhall co-pilot. Elements of the Engineering and Development Directorate also took part in the mission.

Staging from Portland, the NASA NP3A first flew an instrument calibration run over the Astoria airport. Next was a run over the Judy K, normally positioned about 20 miles off the coast near the Columbia River plume, with the aircraft moving along at about 300 mph, pilot Cobb announced

"Nine miles to Judy K, somebody watch for the boat."

A 35-foot chartered fishing vessel, the Judy K was difficult to pick out amidst the rolling white caps of the Pacific. Co-pilot Mendenhall came on the intercom "Two o'clock I think we have it in sight."

The Judy K, a tiny dot between the rolling waves, is faintly visible as the NP3A races along its instruments gathering vital oceanographic data.

As the tiny target appears dead ahead pilot Cobb announces over the intercom, "Boat in 30 seconds, 10 seconds . . ."

As the aircraft zoomed over the Judy K, mission manager Ballinger called over the intercom "Right down the smoke stack, beautiful."

Cobb banked the NP3A sharply and headed for its rendezvous with the Cayuse, some 90 miles away. New coordinates were fed into

into the on-board guidance system and systems manager Gerald Flannagan was heard over the intercom system, "Data on tape looks really good."

A quick look at the data aboard the aircraft prompted OSU oceanographer Mueller to comment. "Everything went well, everything went the way it was designed."

Subsequent passes over the Cayuse and Judy K took the remainder of the scheduled six hour flying time. Between passes over the two ships the NP3A relayed frequent weather reports to Albacore Central.

At the close of the day—normal flying time was 12 noon to 6:00 p.m.—the engineers and scientists looked over the accumulated tapes and strip charts and planned the next day's mission. New position coordinates for the next day were relayed to the two research vessels.



MSC Mission manager Leon Ballinger



Co-pilot Ted Mendenhall